ASSIGNMENT 10

Textbook Assignment: "Horizontal Control." Pages 13-1 through 13-30.

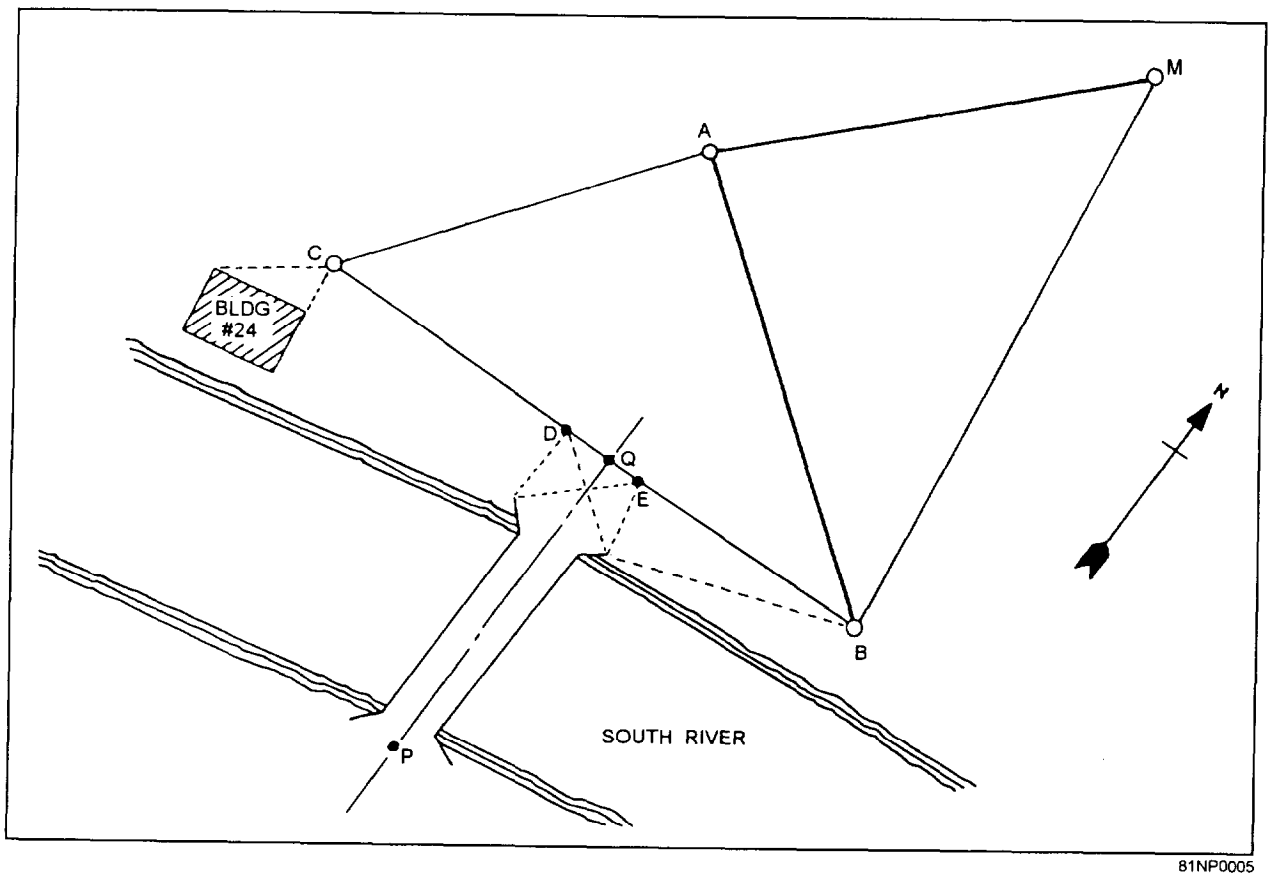

Figure 10A

IN ANSWERING QUESTIONS 10-1 THROUGH 10-3, REFER TO FIGURE 10A. POINT M IS A TRIANGULATION STATION MONUMENT.

10-1. What part of the triangulation network is the main control traverse?

1. △ ABM
2. △ ABC
3. △ CBM

10-2. What part of the network is the supplementary control traverse?

1. △ ABM only
2. △ ABC
3. △ CBM
4. △ ABM and line AC

10-3. What part of the network is the control line?

1. AM
2. AC
3. AB
4. BC

10-4. Direction measured between a traverse line and the preceding traverse line extended is direction by which of the following methods?

1. Azimuth
2. Exterior agle
3. Interior angle
4. Deflection angle

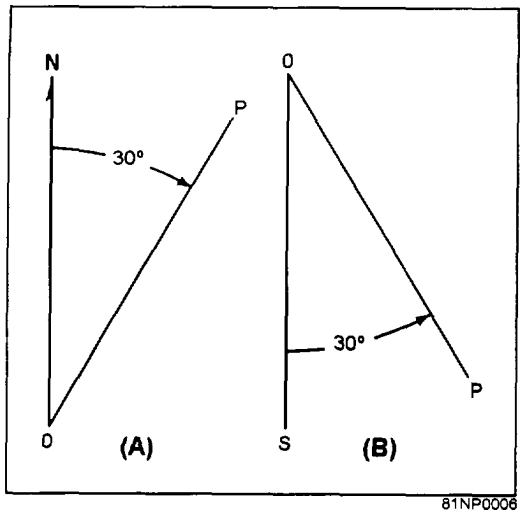

Figure 10B

IN ANSWERING QUESTION 10-5, REFER TO FIGURE 10B.

10-5. What are the respective bearings of traverse lines OP in A and B?

1. N30°E and S30°W
2. S30°W and N30°W
3. S30°E and N30°E
4. N30°E and S30°E

10-6. The bearing of line AB in a traverse is S27°26′W and the bearing of line BC is N10°17′W. What is the deflection angle between AB and BC?

1. 37°43′
2. 79°42′
3. 141°60′
4. 142°17′

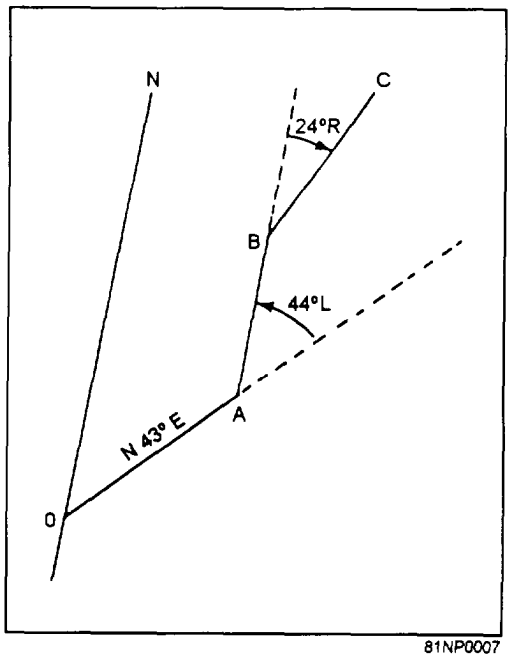

Figure 10C

IN ANSWERING QUESTION 10-7, REFER TO FIGURE 10C.

10-7. The directions of traverse lines AB and BC are indicated by deflection angles. Determine the bearing of BC.

1. N1°E
2. N20°E
3. N23°E
4. N43°E

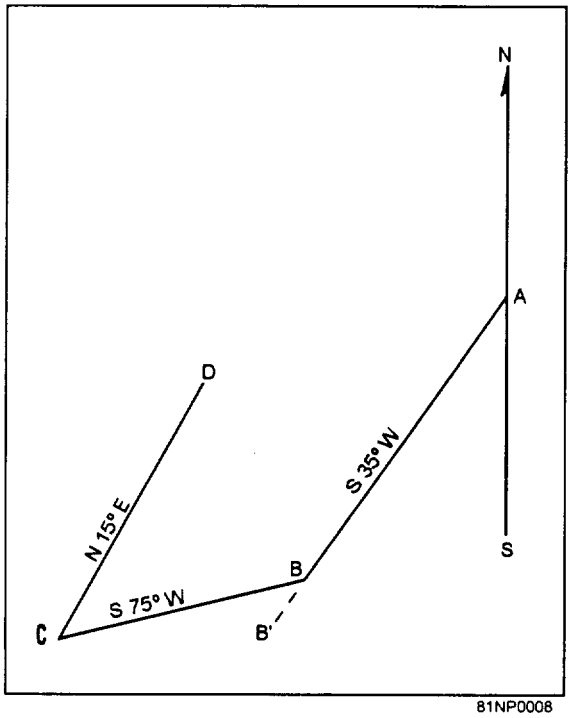

Figure 10D

IN ANSWERING QUESTIONS 10-8 THROUGH 10-10, REFER TO FIGURE 10D.

10-8. What is the size of the deflection angle between traverse lines BC and CD?

1. 60°
2. 90°
3. 105°
4. 120°

10-9. How many degrees are there in the exterior angle ABC?

1. 205°
2. 215°
3. 220°
4. 235°

10-10. How many degrees are there in the interior angle ABC?

1. 120°
2. 130°
3. 140°
4. 150°

10-11. To convert a bearing in the SE quadrant to the equivalent azimuth, you must use which of the following calculations?

1. Add 90° to the bearinq
2. Add 180° to the bearing
3. Subtract the bearing from 180°
4. Subtract the bearing from 360°

10-12. Assume that a measured forward bearing on a compass-tape survey was N15°35'W and the back bearing on the same line was S15°15'E. The difference was probably caused by which of the following conditions ?

1. Declination
2. Local attraction
3. An error in reading the compass
4. A defect in the compass mechanism

10-13. The magnetic declination at a given point on the surface of the earth is the horizontal angle that the magnetic meridian makes with what line?

1. The agonic line
2. The true meridian
3. The isogonic line
4. The assumed meridian

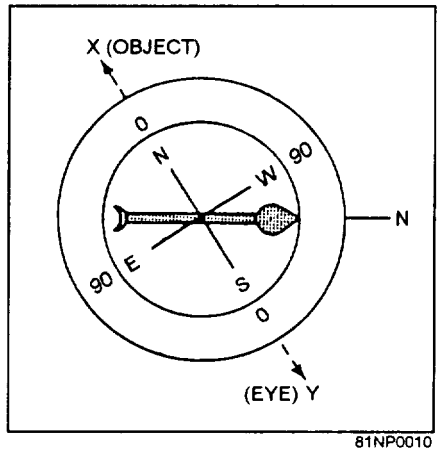

Figure 10E

IN ANSWERING QUESTIONS 10-14 THROUGH 10-16, REFER TO FIGURE 10E.

10-14. What is the approximate compass bearing of the object?

1. Due north
2. S70°W
3. S30°W
4. S30°E

10-15. What is the approximate magnetic bearing of the object if the local attraction is 20°E?

1. Due west
2. S50°W
3. Due south
4. N20°W

10-16. What is the approximate true bearing of the object if the local declination is 10°w and the local attraction is 20°E?

1. S80°W
2. S100°W
3. N80°W
4. N100°E

10-17. What method should you use to correct or convert a compass azimuth reading to a true azimuth reading when both local attraction and local declination are easterly?

1. Subtract the attraction and declination from the compass reading
2. Add the attraction and declination to the compass reading
3. Add the attraction to the compass reading, then subtract the declination from the sum
4. Add the declination to the compass reading, then subtract the attraction from the sum

10-18. When making a closed traverse compass-tape survey, for what reason should you first read and record the back bearing of a traverse line from the first setup point?

1. To offset local attraction
2. To get rid of declination
3. To check the accuracy of your compass
4. To verify the last bearing you will take

IN ANSWERING QUESTION 10-19, REFER TO FIGURE 13-8 IN YOUR TEXTBOOK.

10-19. Suppose that in the compass-tape survey field notes shown, the bearing AE is different from the bearing EA. This difference could have resulted from which of the following conditions?

1. Inaccuracy in reading the back bearing
2. Inaccuracy in reading the forward bearing
3. The difference in the strength of the local attractions at A and E
4. Each of the above

10-20. Station A bears N70°E (true) from station B and station C bears S10°W (true) from station B. What size of angle should be entered in the "computed interior angle" column of a compass-tape survey notebook page alongside the forward bearing of station C?

1. 60°
2. 80°
3. 120°
4. 240°

10-21. What is the sum of the interior angles in a closed traverse consisting of six traverse lines?

1. 360°
2. 540°
3. 720°
4. 1,080°

10-22. If a compass is in error when you are taking bearings at several different places and each error varies from the preceding one, the errors are probably due to which of the following factors?

1. A shifted movable circle
2. A bent frame
3. A bent pivot
4. A bent needle

10-23. The only compass available for taking bearings has an instrument error. What forward bearing should you use when the compass needle indicates a forward bearing of N22°W and a back bearing of S24°E?

1. S2°E
2. S46°W
3. N46°E
4. N23°W

10-24. You are using a compass that has an instrument error and is graduated for azimuths. What forward azimuth should you record when the compass needle indicates a forward azimuth of 37° and a back azimuth of 219°?

1. 37°
2. 38°
3. 91°
4. 128°

10-25. Which of the following defects is most likely to cause a compass to read incorrectly at both ends of its needle?

1. A bent pivot
2. A warped compass card
3. A bent needle
4. A blunt pivot point

10-26. A compass needle that is weak magnetically should be strengthened by which of the following methods?

1. Placing the magnet in an inductive field
2. Drawing the needle over a magnet
3. Placing the magnet in a shielded box
4. Heating the needle with a lighted match

10-27. A compass needle acts sluggishly although it has retained its full magnetism. Which of the following methods should you use to make the needle act smartly?

1. Sharpen its points
2. Sharpen the point on the pivot
3. Reshape it with a special tool
4. Demagnetize it

10-28. In setting up and leveling a transit, you have followed all of the correct procedures. You discover, however, that the plumb bob is still not quite directly over the station point. Which of the following actions should you take next?

1. Loosen two adjacent leveling screws to free the shifting plate and shift the transit head laterally
2. Replace the plumb bob
3. Adjust the tripod legs
4. Re-level the instrument

10-29. Before taking up a transit, which of the following actions should you take concerning the telescope and the vertical motion clamp?

1. Bring the telescope perpendicular to the vertical axis and firmly tighten the clamp
2. Point the telescope vertically upward and firmly tighten the clamp
3. Point the telescope vertically upward and loosen the clamp
4. Point the telescope vertically upward and lightly tighten the clamp

10-30. In which of the following ways are the horizontal limbs of transits numbered?

1. 0°-360° clockwise
2. 0°-360° clockwise, also 0°-90° by quadrants
3. 0°-360° clockwise, also 360°-0° counterclockwise
4. Each of the above

10-31. When you are turning a 40° horizontal angle by transit, what part will normally point to the number of degrees turned?

1. Zero on the A-vernier
2. Zero on the B-vernier
3. 0°-360° graduation on the horizontal limb
4. 40°-320° graduation on the horizontal limb

10-32. Releasing the upper motion of a transit enables you to take which of the following actions?

1. Hold the telescope in place
2. Rotate and train the telescope
3. Hold the horizontal limb in place
4. Rotate and align the horizontal limb

10-33. Which of the following steps should you normally take when turning a 20° horizontal angle from a reference line with a transit?

1. Clamp the lower motion to hold the telescope in place after training it on the reference line
2. Release the lower motion to rotate the telescope 20°
3. Align the 0°-360° graduation on the horizontal limb with the zero on the A-vernier
4. Align the 0°-360° graduation on the horizontal limb with the zero on the B-vernier

10-34. To fix the exact position of the horizontal limb with respect to the A-vernier, what transit screw, if any, should you use?

1. Telescope clamp screw
2. Upper motion tangent screw
3. Lower motion tangent screw
4. None

10-35. To detect accidental movement when measuring a number of horizontal angles from one setup, you should take which of the following steps?

1. Relevel the instrument and check the readings occasionally
2. Adjust the instrument before and after each reading
3. Train the instrument at some clearly defined object to serve as a reference mark for checking the sizes of the angles
4. Take the mean of the observed angles

10-36. The closing-the-horizon method of checking the accuracy of angular measurements is based on the geometrical fact that the sum of the

1. angles in a triangle are 180°
2. angles around a point are 360°
3. acute angles in a right triangle are 90°
4. interior angles of a closed five-course traverse are 540°

10-37. A vertical angle was recorded at +36°. This angle is a measurement of what type?

1. Inclination
2. Declination
3. Depression
4. Elevation

10-38. You are measuring a 30° angle with a 1-minute transit. To improve the precision of this measurement, you turn the angle a total of four times. If the plate reading after the fourth measurement is 119°59°, what is the size of the angle turned?

1. 29°45′45″
2. 29°59′45″
3. 30°00′15″
4. 30°45′15″

10-39. You have measured an angle using the repetition procedure. If the original measurement was 37°22′ and your sixth and last repeat was 224°12′42″, what is the mean angle?

1. 37°5′7″
2. 37°22′7″
3. 37°10′20″
4. 38°00′57″

10-40. Which of the following procedures is a method for extending a straight line?

1. Repeating angles
2. Averaging sets of backsight points
3. Double centering
4. Jiggling in

10-41. What step in the double-centering procedure is taken just before the instrument is rotated through 180° in the horizontal plane?

1. Plunging the telescope
2. Taking the first foresight
3. Taking the backsight
4. Taking the second foresight

10-42. When double centering results in two different extension points, what procedure should you use?

1. Extend your line through the first point
2. Extend your line through the second point
3. Extend your line through a point midway between the two extension points
4. Ignore both points and start over again

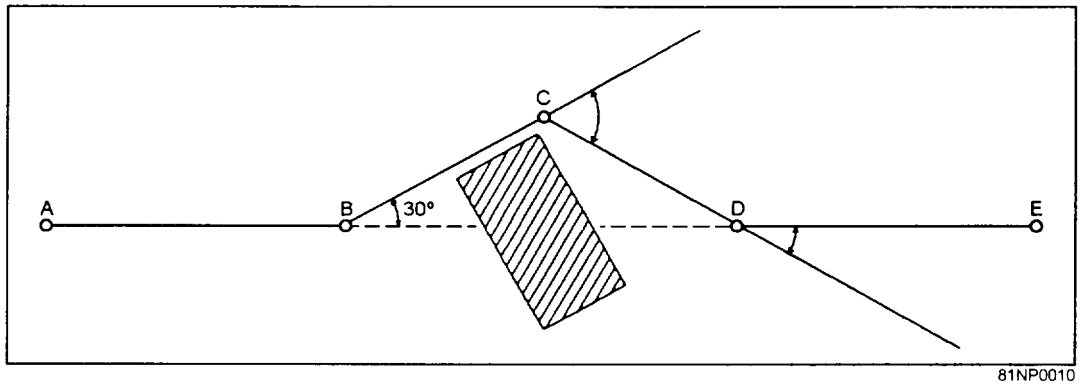

Figure 10F

IN ANSWERING QUESTIONS 10-43 THROUGH 10-46, REFER TO FIGURE 10F. YOU ARE RUNNING THE LINE AE AND THE POWERHOUSE IS IN YOUR WAY. WHILE AT SETUP B, YOU Discovered THAT A 30-DEGREE DEFLECTION ANGLE WILL CLEAR THE OBSTACLE. YOU DECIDED TO USE THIS ANGLE TO BYPASS THE POWERHOUSE.

10-43. What is your next step after recording the deflection angle at B?

1. Take a backsight at A and measure angle ABC
2. Move the instrument to D and measure the deflection angle at D
3. Move the instrument to C and measure the deflection angle at C
4. Move the instrument to A and measure angle BAC

10-44. If you use the angle offset method of bypassing an obstacle, what is the size of the deflection angle at C?

1. 30°
2. 45°
3. 60°
4. 75°

10-45. Which of the following distances is equal to CD?

1. AB
2. BD
3. DE
4. BC

10-46. What is the deflection angle at point D?

1. 30°L
2. 30°R
3. 60°L
4. 60°R

10-47. The angle offset and the perpendicular offset methods are useful in establishing a survey line under which of the following conditions?

1. When the length of the survey line cannot be determined by chaining
2. When the slope becomes great enough to require breaking chain
3. When the line of sight on the chosen survey line is obstructed
4. When the backsiqht distance is much less than the foresight distance

10-48. The “balancing in” process should be used to locate an intermediate point between two control points on a survey line under which of the following conditions?

1. When the distances from the intermediate point to the control points are approximately equal
2. When neither control point is visible from the other, and the other methods of bypassing an obstacle cannot be used
3. When the intermediate point is much closer to one of the control points than it is to the other
4. When the instrument adjustment has a known error

10-49. Moving a transit onto the straight line between two points by a trial-and-error method is referred to by which of the following terms ?

1. Bucking in only
2. Jiggling in only
3. Wiggling in only
4. Bucking in, jiggling in, wiggling in, and balancing in

IN ANSWERING QUESTION 10-50, REFER TO FIGURE 13-19C IN YOUR TEXTBOOK.

10-50. If deflection angles α and β are 4 and 6 minutes, respectively, and distance a equals 4 feet, how far should you set up the instrument from B′ so that it is exactly in line with points A and C?

1. 1.0 ft
2. 1.4 ft
3. 1.6 ft
4. 2.4 ft

10-51. For which of the following situations should the random line method be used?

1. To run a line between nonintervisible end points from an intermediate point from which both end points are visible
2. To run a line between nonintervisible end points when there is no intermediate point from which both end points are visible
3. To establish intermediate stations between nonintervisible end points
4. Both 2 and 3 above

10-52. What tying-in method should you use when locating the configuration of an irregular shoreline from a traverse line?

1. Swing offsets
2. Random lines
3. Range ties
4. Perpendicular offsets

10-53. What meaning is generally given to the term “setting a point”?

1. Establishing a point at a designated location
2. Relocating control points that have been destroyed
3. Locating reference lines for a displaced station
4. Setting the instrument upon a designated point

10-54. You can tie-in a point or set a point to two stations on a traverse by taking which of the following measurements?

1. Its angle and distance from one station
2. Two of its angles, one from each station
3. Its distance from one station and its angle from the other station
4. Each of the above

10-55. Two 50-foot tapes can be used to set a point that is designated by a distance from each of two traverse stations, provided that which of the following conditions exists?

1. The ground is absolutely level
2. The point is not more than 50 feet from either station
3. The tapes are marked off in hundredths of a foot
4. A rough survey is being made

10-56. You are setting a point at given distances from two stations on a traverse. Both distances are longer than your tapes. You could set this point by using which of the following methods?

1. Running the tapes out from both traverse stations and crossing them at the proper point
2. Using a transit and range pole to shoot to the new point
3. Using a transit, rod, and tape to lay off the appropriate distance to the point
4. Solving for one of the interior angles of the triangle and then using a transit, rod, and tape to lay off the appropriate distance to the point

10-57. Surveyors use straddlers for which of the following purposes?

1. To relocate control points that have been destroyed
2. To tie in a new traverse with reference to its angle to an old survey line
3. To tie in a point with reference to its angle from two stations
4. To locate the reference lines for a displaced station

10-58. You must set a marker at a certain point from traverse stations 3 + 00 and 4 + 25. The angle from the traverse line to station 3 + 00 and the distance between the point and station 4 + 25 are given. How should you proceed to set the point?

1. Solve for the other angle from the base line, and the distance of the point from the other station; then, set the point by using transit and tape. Check the distance and other angle from base line
2. Solve for the angle from the base line to the distance line and set the point by the use of transit and tape and check by measuring the base line
3. Lay out the lines to the point with tape and straddlers and check with a transit
4. Lay out the lines to the point with tape and straddlers and check by remeasuring one leg of the triangle

10-59. When tying in a point to a station on a traverse, which of the following conditions should you carefully consider?

1. The selected tie station should not be easily disturbed
2. The tie station must be visible from the point to be tied in
3. Both 1 and 2 above
4. The angle between the tie lines should be no greater than 90°

10-60. A closed traverse was to be 15,000 feet in length. The last course was to be 3,000 feet in length. After you turn the last deflection angle and progress 3,000 feet on the last course, you find that you are 3 feet from the starting point of the traverse. What is the order of precision?

1. First
2. Second
3. Third
4. Fourth

10-61. If precision of 1/20,000 is required, what is the maximum allowable error of closure for a traverse of 10,560 feet?

1. 0.437 ft
2. 0.528 ft
3. 0.759 ft
4. 1.255 ft

IN ANSWERING QUESTION 10-62, REFER TO TABLE 13-1 IN YOUR TEXTBOOK.

10-62. You are running a traverse of nine interior angles, and third-order degree of precision is required. Which of the following sums of the interior angles is acceptable?

1. 1259°59′30″
2. 1259°59′48″
3. 1260°01′ 12″
4. 1260°01′30″

10-63. A temperature correction applied to tape measurements is considered to be a typical precision specification for which of the following surveys?

1. Preliminary surveys
2. Land surveys where the value of the land is high
3. Highway location surveys
4. Both 2 and 3 above

10-64. Which of the following errors in a transit affects both horizontal and vertical angle measurements?

1. The line of sight through the telescope does not coincide with the true optical axis of the telescope
2. The horizontal axis of the telescope is not perpendicular to the vertical axis
3. The axis of each of the plate levels is not perpendicular to the vertical axis of the telescope
4. Each of the above

10-65. Errors that can lead to inaccurate surveying when you use a transit may include which of the following natural errors?

1. Tripod settlement
2. Unequal expansion of transit parts
3. Refraction
4. All of the above

10-66. Which of the following personal errors results in a larger error for inclined sights than for horizontal sights?

1. Failure to focus correctly
2. Failure to center the plate level bubbles exactly
3. Failure to plumb the transit exactly
4. Failure to line up the vertical cross hair with the true vertical axis of the sighted object

10-67. You are having difficulty aligning the transit cross hair with the vertical axis of the sighted object. Which of the following errors is most likely responsible for this difficulty?

1. Improper focusing
2. Not centering the plate level bubbles
3. Plumbing the transit poorly
4. Failure to align the vertical cross hair with the true axis of the object

10-68. Which of the following situations is considered a mistake in transit work?

1. Failure to record the direction in which an angle was turned
2. Turning a deflection angle in the wrong direction
3. Reading the wrong vernier
4. Each of the above

10-69. The carrying case for a transit or a theodolite is specifically designed for which of the following conditions?

1. To protect the instrument from extreme temperatures
2. To serve as a part of the instrument when it is set up for use in the field
3. To prevent excess motion when the instrument is being carried
4. All of the above

10-70. Which of the following actions should you take after an instrument has been exposed to rain and has been wiped down with a clean cloth or chamois leather?

1. Dry it in a heated room
2. Stow it right away in its case
3. Dry it thoroughly at ordinary room temperature

10-71. What is the recommended lubricant for surveying instruments at sub-zero temperatures?

1. Oil
2. Water
3. Petrol
4. Graphite

10-72. Which of the following statements describes the characteristics of an open traverse as compared to a closed connecting traverse?

1. An open traverse has only one previously determined end point, but a closed connecting traverse has two
2. Both types of traverses may not be used for preliminary surveys
3. An open traverse is open at both ends, but a closed connecting traverse forms a loop so that the ends are closed
4. A closed traverse provides fewer checks against error than an open traverse

10-73. In a lower order survey of a road center line, the exact route and station locations are selected so that provisions are made for which of the following conditions?

1. Only the rear station is visible from any station
2. Only the forward station is visible from any station
3. Both stations are visible from any one station and the maximum number of instrument setups can be kept
4. Both stations are visible from any one station and the number of instrument setups can be kept to a minimum

10-74. In double taping between traverse stations, you should use which of the following procedures?

1. Use only tapes that are calibrated
2. Ensure the stations are spaced so that the distance between stations is less than a full-tape length
3. Continue taping until the tie-in control point is reached; then retape all measurements
4. Retape line measurements not within allowable limits

10-75. Which of the following traverse stations may be a point with a known azimuth location?

1. Forward
2. Rear
3. Occupied